AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An apparatus comprising:

a wave guide clad comprising a first material whose refraction index varies by a first magnitude according to a temperature variation of the first material and a second material whose refraction index varies by a second magnitude according to the temperature variation of the second material, the second magnitude being inversely related to the first magnitude~~, the wave guide clad having an effective refraction index that is dependent upon a portion of the area of a side of the second material coplanar with and existing within a cross-section of only a portion of an optical mode surrounding a wave guide core.~~;

a wave guide core within the wave guide clad, wherein the first and second material exist outside of the core.

2. (Original) The apparatus of claim 1 wherein the first magnitude contributes to an increase in the refraction index of the first material in response to the temperature variation and the second magnitude contributes to a decrease in the refraction index of the second material in response to the temperature variation.

3. (Original) The apparatus of claim 2 further comprising a source for producing light.

4. (Previously Presented) The apparatus of claim 3 further comprising a grating to reflect a portion of the light as the light passes through the wave guide core.

5. (Original) The apparatus of claim 4 wherein the second material is a polymer that exists within the grating area.

6. (Original) The apparatus of claim 1 wherein portions of the first material and the second material contribute to an effective refraction index of the wave guide clad.

7. (Previously Presented) The apparatus of claim 1 wherein the effective refraction index is equal to a first sum of the products of the coplanar cross-sectional areas of the second material existing within optical mode and the refraction index of the second material, the core and the refraction index of the core, the first material and the refraction index of the first material, the first sum being divided by a second sum of the cross-sectional areas of the second material existing within the optical mode, the core, and the first material.

8. (Currently Amended) An apparatus comprising:

first means for stabilizing a light's wavelength within a wave guide, the first means comprising two materials, each having a refraction index to change in opposite magnitude in relation to the other in response to variations in temperature of the wave guide~~, the wave guide having an effective refraction index that is dependent upon a portion of the area of a side of one of the two materials coplanar with and existing within a cross-section of only a portion of an optical mode surrounding a wave guide core.~~;

a wave guide core within the wave guide, wherein the two materials exist outside of the wave guide core.

9. (Original) The apparatus of claim 8 wherein variations of the light's wavelength in response to temperature variations of the wave guide depends upon the amount of one of the two materials in relation to the other within an optical mode of the wave guide.

10. (Original) The apparatus of claim 9 wherein one of the two materials is a polymer.

11. (Original) The apparatus of claim 10 wherein the polymer exists on opposite ends of a grating within the wave guide.

12. (Original) The apparatus of claim 8 further comprising a second means for stabilizing the phase of the light across varying temperatures of the wave guide.

13. (Previously Presented) The apparatus of claim 12 wherein the second means comprises the two materials in proportionate amounts so as to make a round-trip refraction distance of a photon of the light substantially independent of temperature.

14. (Original) The apparatus of claim 13 wherein one of the two materials is a polymer and one of the two materials is clad material.

15. (Original) The apparatus of claim 14 wherein the effective refraction index for the wave guide is dependent upon the product of a length of a polymer segment and the refraction index of the polymer.

16. (Currently Amended) An apparatus comprising:

first means for stabilizing a light's phase within a wave guide, the first means comprising two materials, each having a refraction index to change in opposite magnitude in relation to the other in response to variations in temperature of the wave guide~~, the wave guide having an effective refraction index that is dependent upon a portion of the area of a side of one of the two materials coplanar with and existing within a cross-section of only a portion of an optical mode surrounding a wave guide core.~~;

a wave guide core within the wave guide, wherein the two materials exist outside of the waive guide core.

17. (Original) The apparatus of claim 16 wherein one of the two materials is a polymer distributed in segments along the length of a wave guide core within the wave guide.

18. (Original) The apparatus of claim 17 wherein the light's wavelength depends upon the length of the segments multiplied by an effective refractive index of each segment, the effective refractive index of each segment depending upon an amount of the polymer distributed within an optical mode of the wave guide.

19. (Original) The apparatus of claim 18 wherein an effective refraction index of the wave guide is substantially constant from a first end of the wave guide through a grating of the wave guide.

20. (Original) The apparatus of claim 19 wherein the light is produced by a source external to the wave guide.

21. (Original) The apparatus of claim 19 wherein the light is produced by a source internal to the wave guide.

22. (Original) The apparatus of claim 20 wherein the source of the light is a semiconductor optical amplifier (SOA) chip.

23. (Original) The apparatus of claim 22 wherein the wavelength of the light substantially corresponds to the maximum power within the emission spectrum of the SOA.

24. (Currently Amended) A system comprising:

a light source to emit a spectrum of light wavelengths;

a wave guide to guide light from the light source having a first wavelength, the wave guide comprising a clad material, the wave guide including a polymer to help maintain an effective wave guide refraction index within an optical mode of the wave guide that is independent of temperature changes in the wave guide~~, the effective wave guide refraction index being dependent upon a portion of the area of a side of the polymer coplanar with and existing within a cross-section of only a portion of an optical mode surrounding a wave guide core.~~;

a wave guide core within the wave guide clad, wherein the polymer exists outside of the wave guide core.

25. (Original) The system of claim 24 wherein the refraction index of the polymer changes in opposite magnitude of a clad material of the wave guide in response to temperature variations.

26. (Previously Presented) The system of claim 25 wherein the effective refraction index of the cladding depends upon the relative amounts of polymer and other clad material existing within the optical mode of the wave guide.

27. (Original) The system of claim 26 wherein the phase of the light is substantially independent of temperature variations within the wave guide.

28. (Original) The system of claim 26 wherein the wavelength of the light is substantially independent of temperature variations within the wave guide.

29. (Original) The system of claim 26 wherein the wave guide comprises a grating to reflect light wavelengths within the spectrum emitted by the light source.

30. (Original) The system of claim 29 wherein the light source comprises a semiconductor optical amplifier (SOA) to amplify the reflected light wavelengths.